Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A diagnostic imaging system for displaying a vessel tree comprising:

a means for defining a base surface, wherein the base surface is a sphere, the means for defining a base surface, including:

a means for determining vessels centerlines;

a means for mapping the base surface to the centerlines to define a true form surface;

a means for gridding the base surface to define pixels;

a means for projecting along a normal of each pixel; and

a means for assigning each pixel a grayscale value based on grayscale value of voxels intersected by a corresponding normal.

2. (Cancelled)

3. (Currently amended) The system as set forth in claim [[2]] 1, further including:

a means for defining a wall thickness to the true form surface.

4. (Previously presented) The system as set forth in claim 3, wherein the grayscale assigning means assigns each pixel a maximum of grayscale values of voxels within the defined wall thickness intersected by the corresponding normal.

5. (Currently amended) The system as set forth in claim [[2]] 1, further including:

a means for determining a globe surface including a means for mapping the assigned grayscale values into a spherical surface.

6. (Previously presented) The system as set forth in claim 5, further including:

a means for projecting the globe surface into a two dimensional surface.

7. (Previously presented) The system as set forth in claim 6, wherein the projecting means includes:

a matching means which matches coordinates of the spherical surface to coordinates of the two dimensional surface; and

2D grayscale processor which assigns each pixel on the two dimensional surface a grayscale value assigned to at least one corresponding pixel on the globe surface.

8. (Previously presented) The system as set forth in claim 7, further including:

a means for selecting at least one of the true form surface, the globe surface and the two-dimensional surface for displaying on a monitor.

9. (Currently amended) The system as set forth in claim 1, wherein the base surface is a ~~sphere or~~ an ellipsoid.

10. (Previously presented) A diagnostic imaging apparatus comprising:

a scanner which examines a region of a subject including coronary arteries and acquires three-dimensional data;

a reconstruction processor for reconstructing the three-dimensional image data into a volumetric three-dimensional image representation;

the diagnostic imaging system of claim 1 for converting a portion of the three dimensional image representation into a coronary arteries tree display; and

a display connected to the diagnostic imaging system of claim 1 for displaying the coronary arteries tree in a context of the region of interest.

11. (New) A system, comprising:

a base surface processor that approximates a spherically-shaped base surface;

a volume selector that selects a volume of data from a volume memory;

a centerlines determiner that finds centerlines of vessels in the selected volume of data;

a best fitting surface process that draws a spherically shaped best fitted surface to the determined centerlines;

a gridder that spreads a grid over the base surface, thereby gridding the sphere into pixels;

a projector that projects a normal from each pixel; and

an assigner that assigns each pixel a grayscale value based on grayscale value of voxels intersected by a corresponding normal.

12. (New) The system of claim 11, wherein at least one vessel in a first set of the vessels lies above the base surface, at least one vessel in a second set of the vessels lies underneath the base surface, and a third set of vessels includes at least a first vessel that lies above the base surface and at least a second vessel that lies below the base surface.

13. (New) The system of claim 11, further including a centerlines coordinates converter that converts centerlines coordinates to spherical coordinates.

14. (New) The system of claim 13, wherein the centerlines coordinates converter converts the centerlines coordinates to the spherical coordinates as a function of the following: $\varphi = a \tan [Z / \sqrt{(X^2 + Y^2)}]$; $\lambda = a \tan [Y / X]$, and $h = [\sqrt{(X^2 + Y^2)} / \cos\varphi] - R$, wherein φ is a latitude; λ is a longitude; h is a distance from the sphere; X, Y, Z are Cartesian coordinates of a centerline point; and R is a radius of the sphere.

15. (New) The system of claim 11, wherein the volume of data corresponds to a region of interest in a superset volume of data.

16. (New) The system of claim 15, wherein the region of interest represents an anatomical organ.

17. (New) The system of claim 11, wherein the sphere is rotated such that an axis of rotation is substantially parallel to a long axis of a left ventricle.

18. (New) The system of claim 11, further including a true surface determiner that at least one of stretches or shrinks the base surface along sphere normals to fit a true form of the vessels, in which the vessels are not distorted.

19. (New) The system of claim 18, wherein the vessels represent an entire coronary arteries tree in context, including location, connectivity, and surroundings.

20. (New) The system of claim 11, further including a screener that screens the grayscale values of voxels, intersected by each normal, based on predetermined criteria to select a grayscale intensity value which is displayed for the corresponding pixel, wherein the screener selects a maximum intensity value along each normal and stores the value in a maximum intensity image pixel memory.

21. (New) The system of claim 11, further including a presenter that presents a coronary arteries tree on the sphere, best fitted to an amorphous true surface.